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ABSTRACT

A typology (Holland's classification scheme) was used to organize Census data about kinds of employment, survey data about people's aspirations, and the results of vocational assessments made with and without norms for men and women at two educational levels--some high school or above, and some college or above. Results indicate that kinds of employment differ greatly for different educational levels and between the sexes. The distribution of people's aspirations resembles the distribution of actual employment with some notable exceptions. Results also indicate that the use of sex-based interest inventory norms is unrealistic because they create distributions that diverge greatly from the distribution of actual employment. Some implications of the congruence between kinds of people and their employment are discussed for vocational guidance, test development and career development research and theory. (Author)

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THE RELATION OF VOCATIONAL ASPIRATIONS AND ASSESSMENTS TO EMPLOYMENT REALITY

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Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of school, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other than traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. The Careers program (formerly Careers and Curricula) bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, prepared by the Careers program, examines the relationships among the kinds of work people aspire to, the kinds of work that vocational assessments direct them to, and the kinds of work actually available.

Abstract

A typology was used to organize Census data about kinds of employment, survey data about people's aspirations, and the results of vocational assessments made with and without norms for men and women at two educational levels--some high school or above, and some college or above. Results indicate that kinds of employment differ greatly for different educational levels and between the sexes. The distribution of people's aspirations resembles the distribution of actual employment with some notable exceptions. Results also indicate that the use of sex-based interest inventory norms is unrealistic because they create distributions that diverge greatly from the distribution of actual employment. Some implications of the congruence between kinds of people and their employment are discussed for vocational guidance, test development and career development research and theory.

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Joyce Epstein, John Hollifield, and Nancy Karweit made comments useful in preparing this paper.

THE RELATION OF VOCATIONAL ASPIRATIONS AND ASSESSMENTS TO EMPLOYMENT REALITY

It is widely assumed that the degree of congruence or compatibility between a society's people and the work they do is important. This assumption is seen in the work of counselors, personnel workers, and sociologists. A clearer knowledge of the distributions of human potentials--aspirations, interests, competencies, etc.--and the congruence of these potentials with the distribution of the work people do is central to a better understanding of career development, satisfaction in work, and vocational guidance.

The purpose of this paper is to organize and compare evidence about kinds of work people do, about what people want to do, and about the outcomes of standard vocational assessments. How are the kinds of work that people do distributed among different occupational categories? Do the distributions differ by sex and educational level? What kinds of work do people aspire to do? What is the distribution of outcomes of some common vocational assessments? Most important, how closely do the distributions of actual employment, employment aspirations, and vocational assessment outcomes resemble each other?

Method

The research questions require a classification that can organize information about both people and jobs according to kind of work done and level of training or education. Holland's (1973) scheme meets this requirement: it provides explicit rules for classification of all people and all jobs into mutually exclusive and meaningful categories (Realistic,

Investigative, Artistic, Social, Enterprising, Conventional) and specifies the educational level required for all jobs. Also, the scheme has an explicit rationale developed for understanding person-job interactions, and it has received substantial empirical support.

Kinds of occupations

The occupations of men and women detailed in the 1970 Census (U.S. Bureau of the Census, 1973, pp. 582-592) were coded according to the classification scheme for kind and level using the procedure outlined by Holland (1972, 1973). Occupations not listed in the classification were coded by translating the Dictionary of Occupational Titles (U. S. Department of Labor, 1965) code for an occupation into Holland categories using Viernstein's (1972) procedure.

These occupational data include only employed persons and exclude members of the armed forces. In addition, about 5.6% of the men and 6.6% of the women in the Census not classified according to detailed occupation were excluded from our analyses. In the Census these individuals had been "allocated" to one of the major occupational groupings according to their demographic characteristics. The percent allocated within each of the main Census categories ranges from 3.6 to 11.7%--most being allocated in the lowest level categories.

Aspirations and assessments

In general, it was possible to find published data for national representative samples of persons at high school and college education levels to investigate the distributions of vocational aspirations and vocational assessment outcomes.

The distributions of kinds of people were estimated in two ways. First, people's vocational aspirations were coded into Holland categories. Aspirations or occupational choices usually equal or exceed interest inventories in predicting the category of a person's future occupation or choice (Dolliver, 1969; Whitney, 1969; Holland & Lutz, 1968; Gottfredson & Holland, 1974) and have considerable theoretical importance as an expression of a person's self-concept (Super, 1972). People were also classified by their interest inventory scores.

Use was made of vocational aspiration or choice data for nationally representative samples of school populations obtained by the American College Testing Program (Prediger, Roth & Noeth, 1973), data obtained in the Project TALENT follow-up of persons going on to college (Flanagan, Shaycroft, Richards, & Claudy, 1971), and American Council on Education (1972) data on entering college freshmen. It was necessary to recode the TALENT and American Council on Education data to conform to the occupational categories used in these analyses. The American College Testing Program data were obtained using the typology, so no recoding was done.

Vocational assessment data used were American College Testing Program (ACT) Interest Inventory data on nationwide samples of 9th graders and college-bound high school seniors presented by Prediger and Hanson (1974). Because of the controversial nature of the use of sex-specific norming procedures advocated by Prediger and Hanson, these data are shown for both the raw-scoring and normed-scoring procedures so that both can be compared to the distributions of aspirations and actual employment.

Also available were data on diverse, but not representative, samples of 2169 high school boys, 2447 high school girls, 1378 college men, and 1509 college women assessed with Holland's (1972) Self-Directed Search (SDS) collected during several years of research with that guidance simulation. The SDS measures not only interests but also self-reported competencies, activities, and self-ratings.

Level of occupations and people

An occupation's level was defined as the General Educational Development (GED) level listed for that occupation in the Dictionary of Occupational Titles, a measure which correlates .82 with the Duncan socioeconomic index (Nafziger, Holland, Helms & McPartland, 1974). The samples of high school and college people used in the analyses correspond roughly to persons whose eventual GED levels are three and above or five and above, respectively, and thus allow comparisons with the distribution of occupations at those levels as reflected in the Census data. The some-high-school-and-above group (GED 3-6) includes some persons who will belong to the some-college-and-above group (GED 5-6). This overlap diminishes the contrasts between the two groups. Accordingly, the obtained differences underestimate the differences between levels 3-4 and levels 5-6.

Two observations are important. First, level of people has been assessed by using their actual educational levels--not the levels they aspire to. Thus, questions of the match between aspirations and jobs described here pertain to kind, not level, of work. Second, because only kind, not level, of aspiration is used, the distinctions often made among aspiration, preference and choice or expectation (Crites, 1969) are not

relevant here. Empirical evidence indicates that these distinctions have relevance for studying questions of level--prestige, status, etc. (Trow, 1941)--but other research (Dolliver, 1969; Whitney, 1969; Holland & Lutz, 1968; Holland & Gottfredson, 1974) shows that aspirations or choices are usually interchangeable for the study of kind of work. Consequently aspirations and expressed choice have been treated as equivalent measures in these analyses.

Results

The following sections review the main results given in Tables 1-3. No tests of significance were performed because of the large sample sizes.

Employment differences by sex and level

The kinds of employment are distributed in strikingly different ways for the two sexes. For example, 51% of the men in jobs at the some-high school-or-above levels are employed in Realistic occupations. In contrast, only 18% of the women at this level are employed in Realistic occupations. On the other hand, 42% of the women in the some-high-school-and-above group, but only 7% of the men at this level, are employed in Social kinds of work. These and other differences for the some-college-and-above group in Table 1 reveal pervasive differences according to sex in kind of employment.

Insert Table 1 About Here

The distributions of kinds of employment are different for different GED levels. For example, 51% of the men at the some-high-school-or-above

level are employed in Realistic occupations, but only 6% of men's occupations at the some-college-or-above level are Realistic occupations. Only 7% of the men employed in jobs requiring at least some high school hold Social jobs, but the percentage increases to 20% in the Social category for men in jobs requiring at least some college or more.

Sex differences existing at one educational development level do not necessarily exist at the other level. While Conventional jobs at the some-high-school-or-above level are disproportionately held by women, this is not true at the higher level.

Aspirations and jobs

In Table 1, the distributions of vocational aspirations resemble the distributions of actual employment. Two striking differences are exceptions to this generalization. People of both sexes at both GED levels aspire to Enterprising jobs at rates that are far below the employment rate. And people of both sexes at the lower GED levels aspire to both Artistic and Social occupations at rates greater than the employment rate.

Vocational assessments and jobs

Table 1 also shows that the distributions of vocational assessments do not coincide with the distributions of actual employment. In the case of the SDS assessments, this occurrence may or may not be due to the sampling; the samples are best described as large and diverse rather than representative. Even more striking are the divergent distributions produced by the use of norms which treat men and women differently. The normed ACT assessment creates a nearly rectangular distribution of types which is more divergent from either the distribution of aspirations or actual employment than is the unnormed scoring procedure.

Aspirations, assessments, and jobs

Several trends are notable when we compare aspirations, assessment outcomes, and actual employment. One trend is for the vocational assessments and aspirations of men and women to fall much less frequently in the Enterprising category than does actual employment. In addition, aspirations and assessments of women at the some-high-school-and-above level fall much less frequently into Realistic and Conventional categories than they are employed in these kinds of work. Last, among the some-high-school-and-above group there are more Social types than Social employment opportunities. This discrepancy does not exist for the some-college-and-above group.

With some exceptions, the distributions of kinds of people estimated either from vocational aspirations or unnormed assessments do resemble the distributions of actual employment. At the same time, the distributions of aspirations, assessments, and employment of persons with some college or equivalent training are strikingly different from those for persons at lower levels.

Subtype analyses

Two other analyses are important. People do not, of course, resemble one and only one personality type or model. One way of expressing the degree of resemblance to each model is to rank scores resulting from assessments. The first two types, e.g. Realistic-Investigative (or RI), then approximate a person's degree of resemblance to these two models in decreasing order of salience. When this is done, it is common to find that some combinations occur more frequently than others (Holland, 1972).

Table 2 compares the two-letter distribution of occupational codes for employed persons in occupations at level 3-6 derived from the 1970 Census data with the distributions of two-letter SDS codes for a sample

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Insert Table 2 About Here

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of high school men and women. Although the SDS sample is not representative of any well-defined population, it is apparent that the same two-letter combinations tend to be common or rare in both distributions. This suggests that the infrequent occurrence of some codes in vocational assessments is not an anomaly of assessment but corresponds to the uneven distribution of kinds of work in society.

To show that the particular two-letter combinations that are rare is not a peculiarity of the high-school-or-above population, the distribution of two-letter codes for all persons employed in 1970 is shown in Table 3. Two-letter codes remain unevenly distributed. These results support the concept of consistency (Holland, 1973) and its assessment by the SDS (Holland, 1972). Consistency is associated with the commonness of a two-letter code, in both personal assessments (SDS) and in actual employment.

Insert Table 3 About Here

Discussion

The best available data were used for these analyses. Unfortunately the samples were not always comparable. The SDS samples--the only

available assessments of people by subtype--are not representative samples, although they are diverse. No usable data could be located for person assessments based on the Kuder Preference Inventory or the Strong Vocational Interest Blank although the Strong-Campbell Interest Inventory (Campbell, 1974) does assess resemblance to the Holland types used in these analyses. It was also necessary to exclude one source of data on high school students' aspirations (Claudy, 1973) because it was believed that the response format used for the original Project TALENT survey restricted the response options for some kinds of work. This problem does not apply to the TALENT follow-up data recoded in Table 1 because an open-ended format was used. An additional difficulty is that a large proportion of women are now or will be engaged in homemaking. This occupation is not listed in the Census data, and women temporarily not employed are also excluded. Finally, women are disproportionately engaged in part-time work. These peculiarities make interpretations for women more difficult than for men.

The data in Table 1 provide new perspectives on and some hypotheses about job satisfaction, career development, and vocational guidance. One hypothesis is that the areas of greatest divergence between the distributions of peoples' aspirations and the work people get are areas where greatest worker dissatisfaction exists. The observation that a far larger proportion of women are employed in Conventional--clerical and accounting--work than aspire to that kind of work, together with the observation that the tendency to assign women to these kinds of work is one of the most frequently heard complaints of the women's movement,

lends plausibility to this hypothesis. In the same way, the coincidence of high job turnover in sales jobs and the excess of Enterprising--sales and persuasive--jobs over persons aspiring to those jobs also lends plausibility to our satisfaction hypothesis. At the same time it is not implied that these jobs are inherently dissatisfying. The evidence in Table 1 implies that large numbers of people do aspire to these kinds of work and would be satisfied with these jobs. Dissatisfaction would be expected only for those with incongruent personalities.

A second hypothesis is that the frequently observed (Hertzberg, Mausner, Peterson, & Capwell, 1957; Harris & Locke, 1974) tendency for intrinsic rewards to be more important for white-collar workers than for blue-collar workers may be due to the wider variety of work at higher levels. All six kinds of work in the present typology are well represented in the Census categories traditionally called white-collar. In contrast, blue-collar work is largely dominated by Realistic activities, although there are many exceptions to this generalization. (Compare the distributions of jobs for people at different GED levels in Table 1; also see Table 3 in Gottfredson, Gottfredson & Holland, 1974). To test this hypothesis, researchers can categorize workers and work using the typology and see if white-collar workers still value intrinsic rewards more than do blue-collar workers, when person-work congruence is controlled.

A perspective gained from Table 1 is that more attention should be given to the discrepancies among interest assessments, vocational aspirations, and employment rates. Until now large scale estimates of person-job congruence could be achieved only with great difficulty and

at a high cost, because a useful person-job typology was not available. Many research, theoretical, practical, and ethical problems arise from these comparisons for test authors, counselors, and manpower planners.

Although we need more evidence about and discussion of the practical and ethical issues, the comparison of actual employment with normed interest outcomes implies that use of sex norms may be misleading in vocational guidance, especially for women. For one assessment device, the use of norms results in 16 times as many Realistic assessment outcomes for college level women as actual Realistic employment. At the same time, the distributions of aspirations implies that normed interests do not correspond to what people want. In other words, large numbers of people are misleadingly told that their interests resemble those appropriate for jobs that they usually do not get. In addition, predictive analyses (Gottfredson & Holland, 1974) have shown that sex norms vitiate the predictive efficiency of the SDS for women; the same result can be expected for other assessments.

Even if the employment rates of men and women for all kinds of work were identical, a pooling of the data in Table 2 shows that the distributions of work remain grossly uneven: 37.9% of work is Realistic, 6.1% is Investigative, 1.6% is Artistic, 13.8% is Social, 20.0% is Enterprising, and 20.7% is Conventional. Consequently, the rectangular distributions produced by the use of sex norms would still fail to produce a satisfactory solution. More satisfying and effective strategies may be to use only raw scores, encourage vocational exploration at all age levels, use normed interest assessments only with very young people, and adjust raw scores by additive constants or appropriate multipliers.

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Table 1

Actual Jobs, People's Aspirations and Vocational Assessments for Different Kinds of Work by Sex and Educational Level (Per cent)

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Kind of work	Some High School and Above					Some College and Above					
			Vocational Assessment						Vocational Assessment		
	Jobs[a]	Aspirations[b]	SDS[c]	ACT R.S.[d]	ACT Normed[e]	Jobs[a]	Talent Aspiration[f]	ACE Aspiration[g]	SDS[c]	ACT R.S.[d]	ACT Normed[e]
Men											
Realistic	51	46	40	50	24	6	18	14	20	20	21
Investigative	9	16	23	16	16	21	21	16	34	28	18
Artistic	2	11	8	16	17	6	5	5	8	8	18
Social	7	13	20	11	14	20	21	8	24	28	14
Enterprising	25	8	6	4	14	42	28	} 22	11	9	15
Conventional	7	9	3	2	15	6	7		3	7	14
Women											
Realistic	18	7	1	1	14	1	0	1	1	<1	16
Investigative	2	14	8	4	15	5	7	15	15	10	21
Artistic	1	11	13	31	20	5	4	8	16	12	18
Social	24	43	67	52	18	70	76	30	62	67	15
Enterprising	13	5	1	1	13	15	3	} 7	2	3	18
Conventional	42	22	11	11	18	4	10		3	7	12

[a] Based on recode of detailed occupational data, U.S. Bureau of the Census, 1973. Some high school and above includes jobs at GED levels 3 to 6 only. Some college and above includes jobs at GED levels 5 and 6 only.

[b] Vocational aspirations of 11th graders (from Prediger et al., 1973).

[c] Based on unpublished data accumulated for high school and college students. Diverse samples of 2169 high school boys, 2447 high school girls, 1378 college men, and 1509 college women.

[d] Data presented by Prediger and Hanson (1973) for a nationwide sample of 9th graders and college bound seniors for the usual raw-score assessment.

[e] Data for the same persons as the raw-score distribution but scored using sex-based norms (Prediger and Hanson, 1973).

[f] Based on a recode of data presented by Flanagan et al. (1971, Appendices G and M) for college students in the project TALENT follow-up.

[g] Based on a recode of data presented by the American Council on Education (1972). The broad categories used by the American Council on Education make it impossible to separately estimate the proportions of persons aspiring to Conventional and Enterprising occupations. In addition, a large, heterogenous group of "other" aspirations and "undecided" persons are excluded so that the totals are far less than 100%.

Table 2

Kinds of People and Jobs at General Education Development Levels 3-6

Two-Letter Classification of Work	Men			Women		
	Employment		People	Employment		People
	Number	%	%	Number	%	%
RI	10,191,046	27.6	13.4	2,189,980	9.1	.2
RA	151,141	.4	5.1	40,623	.2	-
RS	1,613,183	4.4	13.9	1,143,910	4.8	.3
RE	2,311,874	6.3	5.9	546,831	2.3	<.1
RC	4,476,397	12.1	1.8	366,435	1.5	-
IR	1,531,495	4.1	9.3	174,271	.7	.4
IA	213,908	.6	2.8	24,653	.1	1.5
IS	577,095	1.6	7.9	196,356	.8	5.6
IE	101,048	.3	2.1	14,666	.1	.1
IC	780,705	2.1	.6	76,294	.3	.3
AR	-	-	1.4	-	-	.2
AI	375,826	1.0	1.8	145,262	.6	1.3
AS	190,186	.5	4.1	117,143	.5	10.3
AE	107,352	.3	.9	37,360	.2	.4
AC	-	-	-	-	-	.5
SR	287,361	.8	4.7	1,313,177	5.5	.9
SI	390,627	1.0	4.4	1,120,044	4.7	12.5
SA	1,127,170	3.0	3.1	2,838,797	11.9	24.3
SE	584,744	1.6	6.4	245,989	1.0	11.2
SC	229,044	.6	1.5	229,995	1.0	17.7
ER	267,304	.7	1.1	18,697	.1	<.1
EI	-	-	.7	-	-	.1
EA	286,675	.8	.5	14,723	.1	<.1
ES	7,282,790	19.7	3.1	2,638,996	11.0	.7
EC	1,294,417	3.5	.7	349,427	1.5	.2
CR	215,167	.6	.6	1,678,306	7.0	.1
CI	394,483	1.1	.4	1,427,848	6.0	.2
CA	-	-	<.1	-	-	.8
CS	548,987	1.5	1.0	5,392,007	22.5	9.4
CE	1,361,786	3.7	.8	1,583,837	6.6	.5

Note.-Employment data are based on a recode of detailed occupational categories in the 1970 Census (U.S. Bureau of the Census, 1973). Data on people are outcomes of SDS assessment for diverse samples of 2169 high school boys and 2447 high school girls.

Table 3

Persons Actually Employed by Kind of Work--1970

Kind of Work	Men		Women	
	Number	%	Number	%
RI	13,941,110	30.9	3,329,420	12.2
RA	151,141	.3	40,623	.1
RS	5,188,219	11.5	1,936,951	7.1
RE	2,584,793	5.7	1,664,476	6.1
RC	4,987,524	11.1	516,409	1.9
IR	1,531,495	3.4	174,271	.6
IA	213,908	.5	24,653	.1
IS	577,095	1.3	196,356	.7
IE	101,048	.2	14,666	<.1
IC	780,705	1.7	76,294	.3
AR	--	--	--	--
AI	375,826	.8	145,262	.5
AS	190,186	.4	117,143	.4
AE	107,352	.2	37,360	.1
AC	--	--	--	--
SR	287,361	.6	1,313,177	4.8
SI	390,627	.9	1,120,044	4.1
SA	1,127,170	2.5	2,838,797	10.4
SE	587,744	1.3	245,989	.9
SC	231,344	.5	253,990	.9
ER	267,304	.6	18,697	.1
EI	--	--	--	--
EA	286,675	.6	14,723	<.1
ES	7,282,790	16.2	2,638,996	9.7
EC	1,294,417	2.9	349,427	1.3
CR	215,167	.5	1,678,306	6.2
CI	394,483	.9	1,427,848	5.2
CA	--	--	--	--
CS	593,213	1.3	5,403,358	19.9
CE	1,361,786	3.0	1,583,837	5.8

Note.-Recode of detailed occupational categories (U. S. Bureau of the Census, 1973).